

Cytec Industries Inc.
Fortier Manufacturing Complex
Waggaman, Louisiana
Jefferson Parish

EPA I.D. No. LAD 008175390

Hazardous Waste
Permit Application

Volume V

June, 1998

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Appendix CC
LAC 33:V.517.T.4.b.
Temperature Table

Temperature Table (Degrees F)

Year		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Month											
January	Maximum	58.1	68.9	67.0	59.1	59.4	64.5	59.2	62.6	64.0	61.6
	Minimum	40.6	51.5	47.4	46.4	42.7	49.8	40.7	43.4	41.8	45.9
	Average	49.4	60.2	57.2	52.8	51.1	57.2	50.0	53.0	52.9	53.8
February	Maximum	62.8	64.7	69.1	67.6	67.5	64.2	67.4	66.9	65.8	63.9
	Minimum	43.5	47.1	53.5	48.8	49.1	45.2	46.3	45.6	46.0	50.5
	Average	53.2	55.9	61.3	58.2	58.3	54.7	56.9	56.3	55.9	57.2
March	Maximum	70.0	72.2	73.3	72.6	71.6	68.6	72.6	71.9	68.8	74.2
	Minimum	51.8	53.4	53.2	55.8	52.3	49.0	49.0	54.0	47.9	58.5
	Average	60.9	62.8	63.3	64.2	62.0	58.8	60.8	63.0	58.4	66.4
April	Maximum	78.1	77.4	77.6	78.8	77.0	74.1	80.2	79.0	76.4	73.0
	Minimum	58.7	56.5	57.5	63.6	55.7	53.9	58.9	58.5	57.8	57.8
	Average	68.4	67.0	67.6	71.2	66.4	64.0	69.6	68.8	67.1	65.4
May	Maximum	85.0	85.3	83.9	84.0	84.3	82.6	85.0	86.8	87.2	82.2
	Minimum	61.5	67.5	68.4	71.0	61.3	61.2	65.1	68.4	68.9	66.7
	Average	73.3	76.4	76.2	77.5	72.8	71.9	75.1	77.6	78.1	74.5
June	Maximum	87.5	87.2	92.1	89.9	89.9	89.7	89.9	89.5	89.0	86.2
	Minimum	69.4	71.6	73.1	72.7	71.2	71.1	72.9	69.0	72.1	72.6
	Average	78.5	79.4	82.6	81.3	80.6	80.4	81.4	79.3	80.6	79.4
July	Maximum	89.6	89.4	91.3	92.5	92.2	92.4	89.5	92.9	90.3	91.2
	Minimum	73.6	73.3	73.3	74.4	73.9	74.1	72.0	74.9	75.2	75.5
	Average	81.6	81.4	82.3	83.5	83.1	83.3	80.8	83.9	82.8	83.4
August	Maximum	89.0	91.1	94.2	90.8	88.4	93.3	90.6	94.4	88.5	91.2
	Minimum	73.8	72.2	71.8	72.5	70.7	73.8	71.9	74.9	73.7	75.9
	Average	81.4	81.7	83.0	81.7	79.6	83.6	81.3	84.7	81.1	83.6
September	Maximum	86.6	84.8	89.5	87.0	85.3	89.0	87.9	90.3	86.5	86.8
	Minimum	72.9	69.0	69.6	69.3	71.6	70.4	67.6	68.7	71.5	69.8
	Average	79.8	76.9	79.6	78.2	78.5	79.7	77.8	79.5	79.0	78.3
October	Maximum	77.6	78.4	79.2	82.0	79.7	79.5	78.7	80.5	78.5	80.0
	Minimum	58.3	56.5	57.0	61.2	59.3	60.2	62.9	62.1	62.2	62.5
	Average	68.0	67.5	68.1	71.6	69.5	69.9	70.8	71.3	70.4	71.3
November	Maximum	74.9	71.6	73.7	67.6	66.6	69.2	74.4	70.1	71.4	67.2
	Minimum	56.3	53.1	50.9	44.2	48.1	46.8	56.2	49.5	55.1	50.0
	Average	65.6	62.4	62.3	55.9	57.4	58.0	65.3	59.8	63.3	58.6
December	Maximum	66.5	56.7	68.4	66.6	66.5	62.1	65.7	64.3	66.7	61.9
	Minimum	45.5	37.1	49.5	48.5	49.8	42.2	47.3	46	47.8	43.7
	Average	56.0	46.9	59.0	57.6	58.2	52.2	56.5	55.2	57.3	52.8

Reference: National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center, New Orleans, LA (MSY).

Appendix DD
LAC 33:V.517.T.4.b.
Hurricane Betsy Impact Summary

CORE LABORATORIES, INC.
MINERALS DIVISION
ENVIRONMENTAL SERVICES
P. O. BOX 3303
LAKE CHARLES, LA 70602
318/439-8334



July 24, 1980

Mr. Bob Clark
American Cyanamid
10800 River Road
Westwego, LA 70094

Dear Mr. Clark:

Here is the remaining information concerning the climatological data you had requested. The 24-hour maximums for rainfall go back to 1955. The information from Hurricane Betsy should be more representative of a large scale hurricane.

Maximum Rainfall Over A 24-Hour Period
January 1955 - April 1980

<u>Total Rainfall</u>	<u>Date Occurred</u>
1. 9.86 in.	May 30-31, 1959
2. 8.72 in.	November 5-6, 1975
3. 7.95 in.	April 29, 1980
4. 6.79 in.	May 2-3, 1978
5. 6.50 in.	September 4-5, 1971

Hurricane Betsy
September 9-10, 1965

Barometric Pressure - 29.49"

Rainfall during Sept. 9-10, 1965 - 4.07"

Average Wind Speed (24 hr. period) - 34 mph

Highest Average Wind Speed (3 hr. period) - 60 mph

Wind gusts to 112 mph.

125 mph reported from top of Federal Building in New Orleans.

Winds were generally from the south southeast during the main impact.

Mr. Clark
Page two
July 24, 1980

If you have any questions concerning this information or that which was previously submitted, please do not hesitate to call.

Sincerely yours,

CORE LABORATORIES, INC.

A handwritten signature in cursive script, reading "Jeffrey A. Erion".

Jeffrey A. Erion
Laboratory Supervisor

JAE/rm

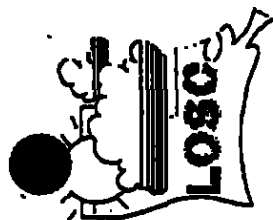
Appendix EE
LAC 33:V.517.T.4.b.
Precipitation Table

Precipitation Table

(RAINFALL IN INCHES)

Year / Month	January	February	March	April	May	June	July	August	September	October	November	December	Total
1966	12.62	10.11	1.90	4.92	9.31	2.10	9.42	2.84	5.55	3.15	0.72	5.44	68.08
1967	4.22	6.80	1.60	2.18	3.56	2.40	6.42	7.51	3.73	3.79	0.45	10.77	53.43
1968	0.54	3.02	3.49	3.59	4.13	3.69	4.96	4.78	2.44	1.40	4.97	6.14	43.15
1969	3.12	4.80	7.08	6.04	5.51	2.47	6.64	7.80	1.08	0.51	1.73	5.26	52.04
1970	2.53	2.28	7.22	0.43	4.68	4.97	3.70	10.21	4.25	4.94	0.85	4.28	50.34
1971	1.13	4.87	3.61	1.53	1.38	8.02	4.55	5.75	16.74	0.58	2.63	6.64	57.43
1972	6.98	6.03	6.07	1.64	6.31	3.10	3.90	4.92	3.29	4.64	8.45	8.65	63.98
1973	2.68	5.40	12.17	10.47	4.68	6.08	5.94	3.37	11.07	5.07	4.04	8.31	79.28
1974	8.46	5.53	6.84	5.52	9.84	3.83	5.66	6.70	7.58	2.26	5.88	4.89	72.79
1975	2.95	3.64	5.32	6.69	8.03	12.28	8.35	10.11	3.97	4.00	11.35	3.81	80.50
1976	2.61	3.85	3.08	0.28	5.58	3.36	5.67	1.69	1.57	5.08	5.80	8.81	47.38
1977	5.62	2.75	3.96	6.38	2.59	1.74	2.91	16.12	13.48	4.33	8.77	4.15	72.80
1978	13.63	2.53	2.67	3.44	9.72	7.82	10.34	14.68	2.98	0.00	4.67	4.42	76.90
1979	5.55	12.49	3.31	4.90	4.38	0.23	11.43	4.57	4.55	1.49	4.27	3.07	60.24
1980	6.37	3.09	10.08	16.12	9.65	3.69	4.84	1.68	6.31	5.87	3.85	1.54	73.09
1981	0.94	8.34	2.70	2.28	5.35	8.47	1.92	11.10	4.78	2.03	1.10	5.50	54.51
1982	2.76	7.86	2.56	5.86	1.19	5.43	13.07	1.92	5.40	3.84	5.45	10.26	65.62
1983	3.31	12.59	4.88	14.86	3.71	10.64	2.95	6.29	5.72	4.88	6.32	9.15	85.30
1984	4.10	8.27	4.90	1.72	3.54	7.21	3.86	9.51	3.79	2.84	2.80	2.53	55.07
1985	4.83	9.28	7.07	2.11	1.16	4.56	6.92	6.37	5.74	13.20	0.96	4.78	66.98
1986	3.49	2.93	1.88	1.50	1.61	8.87	3.60	6.74	1.42	2.87	7.90	5.05	47.86
1987	8.88	7.38	4.39	2.27	3.46	15.01	6.38	5.05	1.29	0.72	2.92	2.88	60.83
1988	3.74	11.31	8.90	9.25	1.68	11.28	6.78	7.53	5.86	2.87	1.26	3.94	74.40
1989	2.47	0.15	7.14	3.20	3.50	8.22	8.34	3.31	4.53	0.51	19.81	6.28	67.46
1990	7.59	11.45	5.98	4.59	5.87	1.01	2.30	2.45	4.55	2.38	3.21	9.67	61.05
1991	19.25	5.42	6.27	15.29	14.28	10.71	13.15	7.86	3.44	1.88	2.19	2.63	102.37
1992	9.94	8.73	6.69	2.52	0.95	9.52	5.75	9.64	6.63	0.55	15.27	5.68	81.87
1993	6.21	2.34	5.65	6.82	7.23	4.86	5.77	2.26	2.47	3.67	2.43	2.90	52.71
1994	3.25	0.54	4.82	2.83	3.67	9.35	8.95	4.59	5.61	2.30	1.39	4.61	51.91
1995	3.66	4.94	7.89	3.91	21.18	2.84	6.44	3.26	0.69	1.31	4.24	5.07	65.43
1996	4.66	1.56	2.97	3.87	1.37	8.6	10.32	8.76	3.96	2.59	3.10	5.55	57.31
1997	6.32	6.88	2.57	4.91	5.03	6.97	3.94	2.25	0.81	1.36	8.09	2.55	51.88
Average	5.45	5.85	5.17	5.06	5.44	6.23	6.41	6.30	4.85	3.03	4.90	3.06	

Reference: National Oceanic and Atmospheric Administration, National Climatic Data Center, Local Climatological Data, Monitoring Station in New Orleans, LA (MSY)



Louisiana Office of State Climatology

Department of Geography and Anthropology
LOUISIANA STATE UNIVERSITY
 Baton Rouge, Louisiana 70803-4105
 (504) 388-6870
 FAX: (504) 388-2912

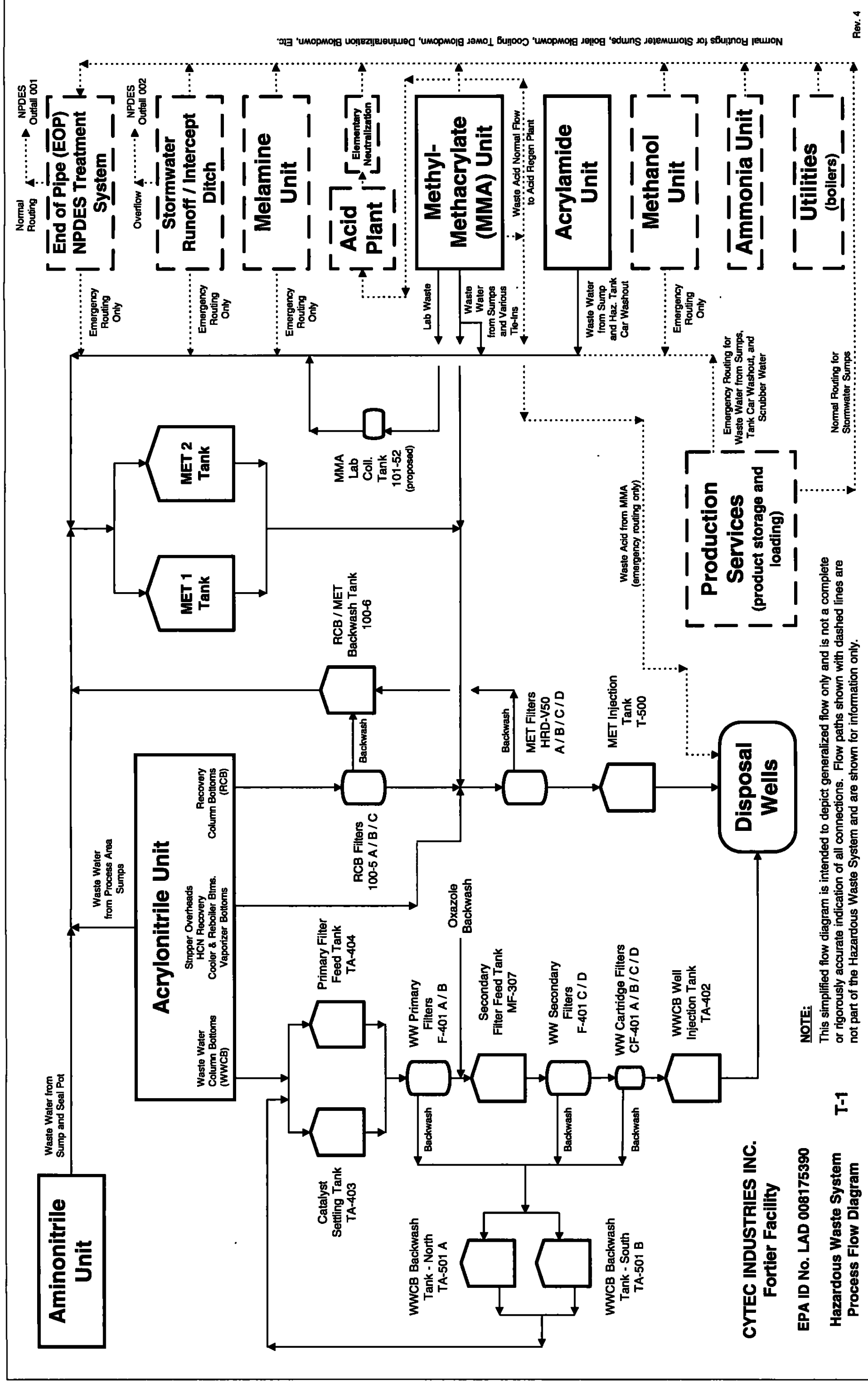
Average Monthly Estimated Pan Evaporation Rates (in inches) based on available stations

Station	Years Based	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Red River	1977-1993	1.7	2.7	4.3	5.6	6.7	7.7	8.2	7.5	5.8	4.2	2.5	2.1
Calhoun	1961-1993	1.9	3.2	4.8	5.7	6.8	7.4	7.8	7.2	5.6	4.4	2.8	2.0
LSU-Ben Hur	1963-1993	2.4	3.2	4.7	6.2	7.1	7.4	6.9	6.4	5.6	5.1	3.4	2.6
Houma	1976-1993	2.4	2.9	4.6	5.8	6.5	6.6	6.4	5.9	5.2	4.4	2.9	2.4
St. Joseph	1976-1985	N/A	3.1	4.4	5.8	7.1	7.9	7.7	7.1	6.0	4.9	3.0	2.6
Jennings	1990-1993	2.3	2.9	4.3	5.2	6.7	7.3	7.4	7.0	5.7	4.8	3.0	2.2

Appendix FF

LAC 33:V.517.T.7.

Hazardous Waste Facility Flow Chart



Appendix GG

**LAC 33:V.517.V.
LAC 33:V.2271**

**Exemption Petition to Land Disposal
Restrictions - Final Approval**



State of Louisiana
Department of Environmental Quality



W.J. "MIKE" FOSTER, JR.
GOVERNOR

August 13, 1996

J. DALE GIVENS
SECRETARY

Certified Mail # P 389 278 599
RETURN RECEIPT REQUESTED

Mr. T. E. Call
Plant Manager
Cytec Industries, Inc.
10800 River Road
Westwego, Louisiana 70094

RE: Cytec Industries, Inc. - LAD 008 175 390
Exemption Petition To Land Disposal Restrictions
Final Approval

Dear Mr. Call:

Review of Exemption documents recently sent to you indicated that a printing error caused loss of text on page 22 (Attachment A). Enclosed is the corrected exemption approval. Please disregard the previously submitted document. If you have any questions regarding this matter, please contact Mr. Mike Miller at (504) 765-0291.

Sincerely,

James H. Brent

James H. Brent, Ph.D.
Administrator

c: Daria Burgess Dias
Tulane Law Clinic
Certified Mail P 389 278 600

Joseph E. LeBlanc, Jr.
Certified Mail P 389 278 601

ENVIRONMENTAL DEPT.

AUG 14 1996

OFFICE OF SOLID AND HAZARDOUS WASTE HAZARDOUS WASTE DIVISION P O BOX 62172 BATON ROUGE LOUISIANA 70864-2172

TELEPHONE (504) 765-0355 FAX (504) 765-0617

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State of Louisiana

Department of Environmental Quality



M.J. "MIKE" FOSTER, JR.
GOVERNOR

J. DALE GIVENS
SECRETARY

Certified Mail # P 389 278 599
RETURN RECEIPT REQUESTED

Mr. T. E. Call
Plant Manager
Cytec Industries, Inc.
10800 River Road
Westwego, Louisiana 70094

RE: Cytec Industries, Inc. - LAD 008 175 390
Exemption Petition To Land Disposal Restrictions
Final Approval

Dear Mr. Call:

The Louisiana Department of Environmental Quality (LDEQ) hereby confirms the May 6, 1994 approval of Cytec Industries, Inc.'s ("Cytec") petition for an exemption to the land disposal restrictions for deepwell injection of hazardous waste. This exemption is granted under LAC 33:V. Chapter 22. The reasons for and findings in support of the LDEQ's decision for granting this exemption are contained in "Reasons For And Findings In Support Of Approval Of No-Migration Petition" (Attachment A), which is attached hereto and made a part hereof.

This exemption is for Cytec Wells No. 1, 2, 3, 4, and 5 (Serial Numbers 970880, 970881, 970884, 971014, and 970863, respectively), permitted by the Louisiana Department of Natural Resources, Office of Conservation, Order No. 93-07 WD. The approval to allow injection of restricted hazardous wastes is subject to the following:

CONDITIONS:

- 1.a) Cytec will, within 180 days of petition approval, drill an ambient monitoring well approximately 1000 feet deep. The well shall be ideally located for security, maintenance, quality control and detection of any upward waste movement into the lowermost underground source of drinking water (USDW). A continuous lithology log shall be maintained from the surface to total depth. *(This condition has been completed.)*

OFFICE OF SOLID AND HAZARDOUS WASTE HAZARDOUS WASTE DIVISION P.O. BOX 82178 BATON ROUGE, LOUISIANA 70884-2178

TELEPHONE (504) 765-0355 FAX (504) 765-0617

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- b) Soil samples shall be collected every ten (10) feet or at significant lithology changes for the first 100 feet \pm (depth of the driven surface casing). The sample exhibiting the highest field screened OVA (organic vapor analyzer) reading shall be analyzed, utilizing USEPA SW-846 methods, for the following: volatile organic compounds (Method 8240) and site-specific parameters as stated in Table 5.1 of the submitted Cytec Groundwater Monitoring Plan. The waters contained in the first water bearing zone and the sand unit known as the "point bar" sand shall also be analyzed for these parameters. *(This condition has been completed.)*
 - c) Drill cutting samples shall be taken from below surface casing to total depth at every connection (30 feet \pm). *(This condition has been completed.)*
 - d) All soil and drill cutting samples shall be stored at the facility for a period of not less than three (3) years.
 - e) Cytec shall sample the waters contained in the lowermost USDW quarterly for a period of one year to establish background levels for monitoring. All background establishing data shall be submitted to the LDEQ as soon as the data is available. *(This condition has been completed.)*
 - f) After background levels have been established, sampling shall be semi-annually and the results submitted to the LDEQ, Land Ban Section within fifteen (15) days after receiving the analytical results. If a change in monitoring parameters is detected which is outside the limits of natural variabilities, the LDEQ shall be notified immediately and sampling shall be conducted monthly until the cause of the change can be determined by the facility with approval of the administrative authority. Monthly test results shall be submitted to the LDEQ within fifteen (15) days of testing.
 - g) In addition to those parameters submitted by Cytec in Table 5.1 of the Groundwater Monitoring Plan, the waters contained in the lowermost USDW shall be tested for any changes in pH, concentration of chlorides, sulfates, and ammonia constituents. All sampling and testing shall be conducted in accordance with the applicable sections contained in "Testing Methods for Evaluating Solid Waste" EPA/SW 846, unless designated otherwise in this approval. All test results shall be maintained in the facility operating record.
 - h) This ambient monitoring plan shall continue for thirty (30) years after the closure of the injection wells.
2. Injection of restricted waste shall be limited to the injection interval ranging in depth from

2990 feet to 3220 feet within an injection zone ranging in depth from 2000 feet to 6132 feet.

3. The cumulative injected volume for the facility shall not exceed 64,800,000 gallons per month into the "3,000 foot" sand.
4. The facility shall cease injection of restricted hazardous waste by March 1, 2006, in accordance with the USEPA exemption conditions.
5. The characteristics of the injected waste stream shall at all times conform to those stated in the petition.
6. The injected waste is limited to the following hazardous waste codes:
D001, D002, D003, F001, K011, K013, P063, P069, U002, U003, U007, U008, U009, U092, U154, U162, and U220.
7. Cytec must petition for approval to inject additional hazardous wastes which do not conform to Conditions No. 5 and No. 6 above. Cytec must also petition for approval to increase the concentration of the waste which would necessitate the recalculation of the limiting concentration reduction factor and the extent of the waste plume.
8. Cytec shall, in accordance with LAC 33:V.2242.Z (now LAC 33:V.2271.Z), submit a detailed report describing the efforts undertaken during the preceding calendar year to reduce the volume and toxicity of the waste generated. At a minimum, one waste reduction activity shall be implemented each year (i.e. Source reduction, recycling, reclamation, reuse, material substitution, etc.).

Noncompliance with any of these conditions is grounds for termination of the exemption in accordance with LAC 33:V.2271.S.1.a.

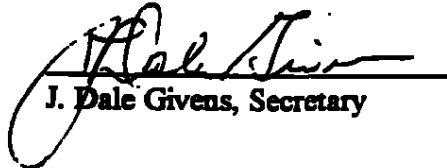
Cytec was notified by letter, dated January 7, 1994, that the LDEQ proposed to approve Cytec's petition for an exemption to the land disposal restrictions. The public comment period for this decision began on January 12, 1994, and a public hearing was held on January 12, 1994, at Kenner City Hall, Kenner, Louisiana. The comment period closed on April 6, 1994. The LDEQ's response to the issues raised during the public comment period are contained in "Comments and Responses" (Attachment B), which is attached hereto and made a part hereof.

This approval is based on a detailed technical review of the submitted petition and support documents, the information submitted and concerns expressed during the public comment period,

and consultations with the Louisiana Department of Natural Resources, Office of Conservation. The LDEQ determined that the Cytec petition has met the requirements of LAC 33:V.2271, by demonstrating that there will be no migration of hazardous constituents from the injection zone for 10,000 years (See Attachment A).

References to regulations have been updated to reflect the current changes to LAC 33:V.Chapter 22, dated January 20, 1996. Should you have any questions concerning this matter, please contact Mr. David F. Beatty, Hazardous Waste Division, Land Ban Section, at (504) 765-0292.

Baton Rouge, Louisiana, this 8th day of August, 1996


J. Dale Givens, Secretary

JDG/DFB/dfb

Attachments

ATTACHMENT A

**STATE OF LOUISIANA
DEPARTMENT OF ENVIRONMENTAL QUALITY**

IN THE MATTER OF:

CYTEC INDUSTRIES, INC.

Fortier Plant

LAD 008 175 390

10800 River Road

Jefferson Parish

Westwego, Louisiana 70094

Exemption Petition to Land Disposal Restrictions

**PROCEEDINGS UNDER THE LOUISIANA
ENVIRONMENTAL QUALITY ACT
LA. R.S. 30:2001, ET SEQ.**

**REASONS FOR AND FINDINGS IN SUPPORT OF
APPROVAL OF NO-MIGRATION PETITION**

Cytec Industries, Inc. ("Cytec") has petitioned the Louisiana Department of Environmental Quality ("LDEQ") for an exemption to the land disposal restrictions for deepwell injection of hazardous waste. LDEQ originally approved Cytec's exemption petition on May 6, 1994. The Court of Appeal, First Circuit, on February 23, 1996, in Docket No. 94/CA/1693, vacated, set aside, and remanded this matter to LDEQ for the issuance of findings to support the approval of Cytec's exemption from the land disposal restrictions. To comply with the First Circuit's decision in this matter, LDEQ herein confirms the May 6, 1994 approval of Cytec's petition for an exemption to the land disposal restrictions for the reasons outlined herein.

The LDEQ land disposal restrictions prohibit the injection of restricted hazardous waste into waste disposal wells. To inject restricted waste, a facility must submit a petition for an exemption from the land disposal restrictions. This petition is reviewed by the LDEQ. Before making a final decision on the exemption, the LDEQ provides the facility requesting the exemption and the public the opportunity to submit written comments on the request for exemption. This comment period runs for 45 days. The LDEQ will, in response to a request or at its discretion, hold a public hearing whenever such a hearing might clarify one or more issues concerning the exemption request. During the review of the Cytec exemption request, a public hearing was held.

After the public comment period and the public hearing, the LDEQ reviews and responds (See Attachment B) to all significant comments and then issues its final decision. The facility may not inject restricted waste unless the exemption is approved.

Any petition for an exemption must demonstrate the following:

1. *The petition must show that the waste streams cannot be reasonably eliminated or significantly reduced through waste reduction. (LAC 33:V.2271.A.1)*
2. *The petition must show that no other economically and environmentally reasonable alternative to disposal into an injection well is available. (LAC 33:V.2271.A.1)*
3. *The petition must demonstrate to a reasonable degree of certainty that the waste shall be permanently confined to the injection zone (no migration of hazardous constituents from the injection zone for as long as the wastes remain hazardous or for 10,000 years). (LAC 33:V.2271.A.2 and LAC 33:V.2271.D)*
4. *A petition must be for the disposal of a specific waste stream into a specific injection well or wells. (LAC 33:V.2271.B)*
5. *The petition must contain a waste monitoring plan. (LAC 33:V.2271.N)*

Cytec submitted a petition for an exemption. "American Cyanamid Company, Fortier Plant: Petition for an Exemption to the Hazardous Waste Injection Restriction Program" (petition). Cytec operates five Class I injection wells which handle wastes which are routinely generated from the acrylonitrile, acrylamide, aminonitrile, and methyl methacrylate plants. The hazardous wastes which are handled by these wells are injected into the "3,000 foot" sand zone at a depth of 2990 to 3220 feet.

FINDINGS OF FACT

1. **WASTE REDUCTION - LAC 33:V.2271.A.1**

No exemption shall be granted to a generator for the land disposal of a waste stream if the waste stream can reasonably be eliminated or significantly reduced through waste reduction. The petitioner must have a plan in effect to reduce the volume and toxicity of the waste. This plan must contain the waste reduction processes considered, those rejected, and

why they were rejected.

Cytec was required to submit a supplement to the petition to satisfy LAC 33:V.2271.A.1. Cytec submitted a "Waste Reduction Plan" (Plan) dated June 1, 1990, in response to LDEQ's request. Cytec has also detailed ongoing waste minimization efforts in a letter dated March 18, 1992, located in Volume 15, Section G, of the petition. The Plan demonstrates that waste is minimized by recovering acrylonitrile from laboratory wastes; purifying and selling coproduct hydrogen cyanide as a product; returning approximately 15% of the unreacted acid from the methyl methacrylate process to the acrylonitrile process; and constructing an acid regeneration plant.

The Waste Reduction Plan shows that:

- Approximately 40 waste reduction projects are proposed by plant employees each year.
- The projects implemented result in an average reduction of 500,000 tons per year of waste generation.
- Between 1987 and 1989, a total of 109 waste reduction projects were implemented at Cytec resulting in a reduction of approximately 1.649 million tons of waste generated.
- The projects implemented included installation of various collection systems, reclamation and recovery of several waste streams; reuse of several categories of wastes; and reduction or elimination of certain wastes and waste categories.

The Plan includes the waste streams that are currently being deepwell injected as required in LAC 33:V.2271.C.2.

The LDEQ has reviewed Cytec's Waste Reduction Plan, the waste reduction projects implemented, their results, and the projects that were rejected by Cytec. Cytec has made extensive efforts to reduce the total volume and the concentrations of the hazardous waste generated and has achieved some success. The Department has determined that the Cytec waste streams cannot, at this time, be reasonably eliminated or more significantly reduced through waste reduction. Therefore, Cytec has satisfied the waste reduction requirements for an exemption. In accordance with LAC 33:V.2271.Z, Cytec is required to submit a yearly waste reduction report to the Department.

2. **ALTERNATIVES TO INJECTION - LAC 33:V.2271.A.1**

The petitioner must show that no other economically and environmentally reasonable alternative to disposal into an injection well is available. Also, the petitioner must have made a good-faith effort to use, reuse, reclaim, or recycle the waste in a manner other than disposal.

Cytec and their consultants conducted studies to determine the technically feasible alternatives to deepwell injection. These studies were presented in Volume 7 of the petition dated March 17, 1992. Alternatives to injection for each waste stream (waste acids and wastewaters from processing materials, such as methyl methacrylate, acrylonitrile, and miscellaneous effluents) are described.

WASTE ACIDS:

Of the alternatives investigated in the study, treating the waste acid to meet land disposal standards using the best demonstrated achievable technology (BDAT) was considered. For waste acids, BDAT is deactivation to pH of >2.0 . This alternative was rejected. To treat the waste acid using BDAT, Cytec would approximately double the waste generated. The 150 tons per year of solid salts generated by the deactivation of the waste acid would require management and/or disposal at an appropriate solid waste facility.

WASTEWATERS:

The alternatives evaluated by Cytec are listed below:

- Incineration
- Process Wastewaters
 - wet oxidation to meet BDAT*
- Additional In-Process Source Reduction
 - "hot quench" technology to separate wastestreams in-process*
 - solvent extraction*
 - methanol injection*
- Reuse in Lieu of Raw Material
 - coal gasification*
- Reclamation
 - supercritical extraction*
 - solvent extraction*
 - evaporation*
- Treatment

biological detoxification
oxidation of organics
solar oxidation
peroxidation systems
supercritical water oxidation
cyanide treatment processes
other wet-air oxidation technologies
other biological treatment.

The following discussion summarizes Cytec's presentation of some negative impacts associated with the above-listed alternatives:

- **Incineration** - Incineration of these streams is highly energy intensive and likely to generate indirect adverse environmental impacts due to high energy usage. Incineration is not feasible due to the volume requiring treatment.
- **Processing Wastewaters** - Processing the wastewaters with wet oxidation would reduce the concentration of some organics in the acrylonitrile waste stream, but the residual organics and ammonium sulfate not affected by the treatment would potentially cause adverse impact to surface water if discharged. The injection wells would continue to receive the same volume of hazardous waste, with reduced concentrations of some organic constituents.
- **In-Process Source Reduction** - The "hot quench" technology may not meet BDAT criteria. This also results in the formation of increased tar and polymer, which would later require incineration. Incineration of the waste requires additional energy and transportation off-site. Solvent extraction and methanol injection did not show substantial reduction and/or BDAT compliance for constituents of concern.
- **Reuse and Reclamation** - Reuse such as coal gasification and reclamation activities such as supercritical extraction, solvent extraction, and evaporation were tested and found to be unfeasible as an injection substitute due to formation of additional wastes and inability to meet BDAT criteria.
- **Other Treatment Methods** - Other treatment methods such as biological detoxification, oxidation of organics, and solar oxidation were investigated. These treatments rely on innovative technology that may give inconsistent results while requiring a large expenditure for implementation. The descriptions of these

technologies are discussed fully in Volume 7 of the petition dated March 17, 1992.

The LDEQ has determined that:

- The alternative waste disposal processes, summarized above, would result in greater exposure of the public and the environment to hazardous materials and toxic aqueous, gaseous and/or solid residues than exists in deepwell injection.
- The capital and energy costs of such processes were determined to be economically unreasonable.
- Cytec has made a good-faith effort to find alternative methods to treat their waste streams, and does employ waste minimization to the extent feasible to reduce the volume of the materials deepwell injected.

Therefore, in accordance with LAC 33:V.2271.A.1, the Department finds that there are no reasonable alternatives, at this time, to deepwell injection of Cytec's waste streams.

3. **PERMANENT CONFINEMENT OF THE WASTE - LAC 33:V.2271.A.2 and LAC 33:V.2271.D**

Permanent confinement means there will be no migration of hazardous constituents from the injection zone for as long as the wastes remain hazardous or for 10,000 years.

In order to satisfy the requirement of permanent confinement, to a reasonable degree of certainty, a petitioner must establish:

- **SITE GEOLOGY AND GEOCHEMISTRY - LAC 33:V.2271.D.1**
The hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that one of the following reliable predictions can be made:

NO-MIGRATION - LAC 33:V.2271.D.1.a

1. Fluid movement conditions are such that the injected fluids will not migrate within 10,000 years, either vertically upward out of the injection zone, or laterally within the injection zone, to a point of discharge or interface with an underground source of drinking water.

CHEMICAL FATE - LAC 33:V.2271.D.1.b

2. If the injected fluids do migrate out of the injection zone or to a point of discharge, the fluid will no longer be hazardous.

- **AREA OF REVIEW (AOR) - LAC 33:V.2271.D.3.a**
The injection well's AOR includes at least a two-mile radius around the injection well.
- **ARTIFICIAL PENETRATIONS - LAC 33:V.2271.D.3.b and LAC 33:V.2271.V**
All wells, within the AOR, that penetrate the injection zone or the confining zone, have been located and identified. For any well that was improperly plugged, completed, or abandoned, the applicant has submitted a corrective action plan.
- **MECHANICAL INTEGRITY - LAC 33:V.2271.D.3.d**
All injection wells must have mechanical integrity.

To satisfy the requirement of permanent confinement, Cytec submitted "American Cyanamid, Fortier Plant: Petition for an Exemption to the Hazardous Waste Restriction Program" dated May, 1990, and "Request for Exemption from the Prohibition on Deepwell Injection of Hazardous Waste" dated March, 1992, to demonstrate that the injected wastes will not migrate within 10,000 years, either vertically upward out of the injection zone, or laterally within the injection zone, to a point of discharge or interface with an underground source of drinking water.

The following table provides a representation of the relationship between ground level and various zones of interest beneath the Cytec facility:

DEPTH OF KEY ZONES FOR CYTEC PETITION (Volume 1, Section 5 and Volume 2, Figures 5-1 through 5-31)	
GROUND LEVEL	0 feet
Base of Lowermost Underground Source of Drinking Water (USDW)	-928 to -942 feet
Top of the Confining Zone	- 1320 feet
Base of the Confining Zone and Top of the Injection Zone	-2000 feet
Well 4 Injection Interval	-2360 to -2486 feet
Wells 1,2,3, and 5 Injection Interval "3000 Foot" Sand	-2990 to -3220 feet
Base of the Injection Zone	-6132 feet

Site Geology and Geochemistry - LAC 33:V.2271.D.1

To satisfy the requirement of this section, the petitioner must show that the geology and geochemistry of the area are suitable for the waste being injected. The injection zones must be able to contain the volume of waste injected and the confining zone must be able to limit the movement of the waste.

The information submitted in the petition on the geology and geochemical conditions at the Cytec site and the physiochemical nature of the waste streams was reviewed by the LDEQ.

This information included the following:

- **A discussion of the depositional environments of the confining and injection zones, Volume 1, Section 5 (Regional Geology) and Section 4 (Hydrology) of the petition;**
- **Geologic cross-sections using geologic well logs from regional area wells, Volume 2, Figures 5-4 to 5-28 of the petition;**
- **Geologic maps constructed using all wells within the predicted plume area, Volume 2 of the petition;**
- **A review of all plugging and completion records for the wells within the predicted plume area, Volume 1, Section 9 (Artificial Penetrations) and Volume 2, Figure 9-1 of the petition;**
- **Conventional core analysis to determine the permeability and porosity of the injection zone, Volume 1, Section 10 (Compatibility Issues) and Volume 4, Appendix 5-I (Special Core Analysis Report) of the petition; and**
- **A description of the physical and chemical characteristics of the injection zone and the confining zone, Volume 1, Section 5 (Geology) of the petition.**

After evaluation of the geology in the Cytec area, the Department has determined, to a reasonable degree of certainty, that:

- **The injection zone and injection intervals have sufficient permeability, porosity, thickness, and areal extent to contain the maximum volume of hazardous waste allowed to be injected (64,800,000 gals per month). (LAC 33:V.2271.K.1)**
- **The confining zone is laterally continuous and free of transmissive faults or fractures over the predicted waste plume area to prevent movement of waste fluids into any underground source of drinking water. (LAC 33:V.2271.E)**
- **The injected wastes are compatible with the injection and confining zones, and the wastes would not adversely alter the capabilities of the injection zone or confining zones to contain the waste. (LAC 33:V.2271.M.2)**

Therefore, the Cytec facility is located at a geologically suitable site for the injection of hazardous waste.

No-Migration - LAC 33:V.2271.D.1.a

In demonstrating no-migration of hazardous constituents from the injection zone, the petitioner must prove to a reasonable degree of certainty that the waste shall not migrate from the injection zone for 10,000 years.

The petitioner used computer predictive simulations consisting of a combination of numerical and analytical models to meet the requirements of this section. Volume 3 of the petition and "American Cyanamid Response to EPA NOD dated December, 1992", describe the Sandia-Waste Isolation Flow and Transport Model (SWIFT Release 4.84) used to define the 10,000 year plume.

This model was verified and determined to be appropriate for the Cytec site, waste streams, and injection conditions. All parameters were conservatively assigned to model the worst-case conditions for waste movement. Volume 1, Section 8 of the petition details the justification of fundamental assumptions and selection of input parameters.

Under worst-case conditions, the vertical movement up a brine-filled borehole was predicted to be a distance of 587 feet. Lateral movement was predicted to be 6.3 miles to the north and 8.0 miles to the south in the "3,000 foot" sand. These results are discussed in Volume 1, Section 8 and Volume 3 of the petition. These maximum distances would be reached by the waste plume at the end of 10,000 years.

The LDEQ has reviewed the no-migration model and the model results submitted by Cytec. All model parameters were reviewed and determined to be reasonable and conservative for the site. The Department concluded that all waste movement will be contained within the injection zone and will not come into contact with any point of discharge or interface with an underground source of drinking water (USDW) for 10,000 years. Therefore, the LDEQ has determined that Cytec has met, to a reasonable degree of certainty, the no-migration requirements in LAC 33:V.2271.D.1.a.

Area of Review (AOR)- LAC 33:V.2271.D.3.a

The required AOR around the injection wells is stated as "at least the two-mile radius around the bore hole". (LAC 33:V.2271.D.3.a) The LDEQ was concerned that waste movement would be outside of this two-mile radius during the required 10,000 year time

period. With this in mind, the LDEQ required the petitioner's AOR to include the area in which the waste plume was predicted to move.

Cytec investigated the AOR for the required 2-mile radius and included all areas affected by the movement of the waste plume. This AOR was extended a minimum of 6.0 miles to the north and 8.0 miles to the south. This enlarged AOR was the minimal area of study in all demonstrations submitted in the petition.

Artificial Penetrations - LAC 33:V.2271.D.3.b

The petitioner is required to locate and identify all wells (artificial penetrations) in the AOR that penetrate the injection or confining zones. If any well was completed or plugged improperly, the petitioner must submit a corrective action plan for that well.

Cytec submitted information that detailed the location and identity of all wells penetrating the injection or confining zones within the AOR. All known wells within the AOR were identified. These artificial penetrations are plugged or constructed to prevent the endangerment of the USDW. This information is contained in Volume 1, Section 9 of the petition. Volume 2, Figure 5-31 and 9-1 include the locations of oil and gas fields in northern St. Charles and Jefferson Parishes and an oil and gas base map. Volume 5, Appendix 9-I contains a data summary table, well schematics, and the construction, completion, and plugging records for these wells.

Upon review of the well information submitted, the LDEQ has assessed that all known wells within the AOR were adequately completed or plugged to prevent any waste movement out of the injection zone. (LAC 33:V.2271.D.3.b)

Mechanical Integrity - LAC 33:V.2271.D.3.d

To assure that the waste will be injected only into the approved injection zone, each injection well must have mechanical integrity. A well has mechanical integrity when there is no significant leak in the casing, tubing, or packer, and when there is no significant fluid movement into the USDW through vertical channels adjacent to the injection wellbore.

For each injection well Cytec submitted the results of pressure and radioactive tracer tests. This information is presented in Volume 1, Section 11 and Volume 4, Appendix 11-I of the petition.

The LDEQ reviewed all the mechanical integrity test and well construction information. Each injection well at the Cytec facility meets the criteria for mechanical integrity. (LAC

33:V.2271.D.3.d)

4. **SPECIFIC WASTE STREAMS & SPECIFIC INJECTION WELLS - LAC 33:V.2271.B**

A petition for an exemption must be submitted for specific wastes to be injected into specific wells.

Cytec submitted a list of all waste streams that are injected into their five wells, in Volume 2, Table 2-A and Volume 5, Appendix 2-I, and Appendix 2-II of the petition. These waste streams are identified by the following United States Environmental Protection Agency (USEPA) hazardous waste codes:

D001, D002, D003;
F001;
K011, K013;
P063, P069;
U002, U003, U007, U008, U009, U092, U154, U162, U220.

The Cytec petition specifies that the principal waste streams injected are generated from the acrylonitrile, acrylamide, and aminonitrile and methyl methacrylate plants. These waste effluents are injected into wells at their facility site and the injection depths are set at 2980 - 3220 feet.

The geochemistry of the injection zone was described using off-site conventional and sidewall cores. Cytec provided demonstrations that the waste streams would not adversely alter the confining capabilities of the injection and confining zones. (See Volume 1, Section 10 of the petition.)

The LDEQ has evaluated the waste streams and injection well information submitted. The Cytec petition meets the requirement that specific waste streams be injected into specific injection wells. Therefore, Cytec has satisfied the requirements of LAC 33:V.2271.B.

5. **AMBIENT MONITORING - LAC 33:V.2271.N**

Based on a site-specific assessment of the potential for fluid movement from the well or injection zone, and on the potential value of monitoring wells to detect such movement, the

administrative authority shall require the owner or operator to develop a monitoring program. (LAC 33:V.2271.N.1)

The monitoring program shall include (LAC 33:V.2271.N.2):

- a. monitoring of the first aquifer overlying the confining zone;*
- b. use of indirect, geophysical techniques to monitor the position of the waste front or to provide other site-specific data;*
- c. monitoring of the groundwater quality in the first aquifer overlying the injection zone;*
- d. monitoring of the groundwater quality in the lowermost USDW;*
- e. additional monitoring may be necessary to determine whether fluids are moving into or between USDW's.*

The administrative authority may exempt the owner or operator from any requirements which are deemed to be unnecessary or not feasible, or which pose undue risks. (LAC 33:V.2271.N.3)

Cytec's original petition, dated June 1, 1990, did not address the requirements of LAC 33:V.2271.N (Ambient Monitoring). The Department found the petition to be inadequate and deficient and sent Cytec a "Notice of Deficiencies" ("NOD") letter, dated May 29, 1992. Cytec's response, dated July 17, 1992, was deemed inadequate and another NOD was issued on May 17, 1993 (Technical NOD #2). Both NODs required, in part, that Cytec address the requirements of LAC 33:V.2271.N. Cytec's response to Technical NOD #2, dated July 14, 1993, addressed all requirements of LAC 33:V.2271.N and requested exemption from the requirements contained in LAC 33:V.2271.N.2.(a-d). Cytec's request for an exemption from LAC 33:V.2271.N.2.d (monitoring of the lowermost USDW) was denied. Cytec responded by submitting the "Groundwater Monitoring Plan", dated December, 1993. Cytec's request for an exemption from LAC 33:V.2271.N.2.(a-c) is discussed later.

Cytec will submit, as required in LAC 33:V.2271.N.1, annual reports that contain a description of falloff test procedures, results and analysis of the pressure falloff test, and comparison of test reservoir parameters used in the flow and containment modeling. Static and

flowing formation pressures will also be recorded and reported for each falloff test. These annual tests will be performed for each injection well.

Cytec has drilled a monitoring well approximately 1,000 feet deep in accordance with Condition #1.a of the May 6, 1994 issuance. A well at this depth will ensure that the lowermost underground source of drinking water (USDW) can be monitored, as required by LAC 33:V.2271.N.2.d. The well is ideally located for security, maintenance, quality control and

detection of any upward waste movement into the lower portion of the USDW. The monitoring of the lowermost USDW will continue for thirty (30) years after the closure of the injection wells. Cytec detailed these monitoring activities in its submittal entitled, "Groundwater Monitoring Plan", dated December, 1993.

Cytec requested an exemption from the following ambient monitoring requirements:

- 1) The use of indirect, geophysical techniques to determine the position of the waste front, the water quality in a formation designated by the administrative authority, or to provide other site-specific data (LAC 33:V.2271.N.2.b);
- 2) Continuous monitoring for pressure changes in the first aquifer overlying the confining zone and sampling of the aquifer on a quarterly basis to analyze for constituents specified by the administrative authority (LAC 33:V.2271.N.2.a); and
- 3) Monitoring of the groundwater quality in the first aquifer overlying the injection zone (LAC 33:V.2271.N.2.c).

The LDEQ evaluated Cytec's request for an exemption from the use of indirect, geophysical techniques (LAC 33:V.2271.N.2.b). The LDEQ acknowledges that at present, there is no known indirect, geophysical technique to determine the position of the waste front or water quality at the injection depths at the Cytec facility. However, if at a future date a method becomes available, Cytec will be required, under LAC 33:V.2271.N.2.e, to amend their monitoring program to incorporate the new method. At this time, the monitoring requirements of LAC 33:V.2271.N.2.b are deemed not feasible.

Initially, seismic lines were required in the May 29, 1992 NOD, but the Department later decided that these lines were not needed to determine "to a reasonable degree of certainty" that the waste would not migrate. The Department's requirement to submit seismic lines, in the May

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17, 1993 NOD, was based on Cytec's request for an exemption from LAC 33:V.2271.N.2.a.&c. The Department would use these seismic lines in their evaluation of Cytec's request for monitoring exemptions.

The LDEQ evaluated Cytec's request for an exemption from monitoring for pressure changes in the first aquifer overlying the confining zone (LAC 33:V.2271.N.2.a) and monitoring the groundwater quality in the first aquifer overlying the injection zone (LAC 33:V.2271.N.2.c). The evaluation made use of geologic mapping, cross-section work, well logs, and particularly, confidential seismic line interpretations for the Cytec facility. The seismic information allowed LDEQ to determine, to a greater degree of certainty, that there would be no migration of waste from the injection zone into any unpermitted zone or into the lowermost USDW. Therefore, a monitoring well into the first aquifer overlying the injection zone or into the confining zone was deemed to be unnecessary. The Department has also determined that the drilling of additional monitor wells into the confining zone could pose undue risks to the integrity of the confining zone and may provide a conduit for waste migration from the injection zone.

The LDEQ also reviewed a report entitled "Water Quality Trends at Pinellas County Injection Well Sites, UIC Criteria and Standards" by the Florida Bureau of Drinking Water and Ground Water Resources (January 1991). This report was a case study in a different geologic setting than that at Cytec. The Pinellas County, Florida study does not discuss the geology of the confining zone, but it is relatively thin (about 200 feet thick) and apparently lacks the integrity to isolate the underlying saline water-bearing aquifer from the shallower fresh water-bearing aquifer. In contrast, the Cytec site has a number of thick clay strata, a soil/rock type known to provide excellent confining characteristics, within the approximately 2,000 feet between the injection interval and the base of the lowermost USDW. The LDEQ concluded that the geological conditions existing in the Pinellas County injection wells were much different than those existing at the Cytec site.

In addition to the report on the Pinellas County, Florida site, the department also reviewed a report titled "Monitoring of Subsurface Injection Wastes, Florida" by John Vecchioli (June 1979). This report included case studies of seven sites active in Florida at the time. The report indicated in the introduction that:

The level of monitoring required differs for each situation in accordance with the hydrogeologic factors and the quality and quantity of the injected waste liquid. Monitoring may be minimal in places where: (1) the hydrology of the aquifer system can be conceptualized with a high degree of confidence, (2) the waste-receiving

aquifer is known to be adequately isolated hydraulically from fresh-water aquifers, (3) well construction problems are minimal, (4) small volumes of low-toxicity wastes are injected, and (5) the waste is chemically compatible with the receiving aquifer. Throughout much of Florida, however, these conditions are not realized either in total or in some instances, even in part. The hydrologic characteristics of the carbonate rocks underlying Florida are not easily conceptualized because of difficulties in predicting porosity and permeability distribution owing to irregularly-spaced fracture and solution openings.

The hydrogeologic conditions existing in Florida which necessitate monitoring simply do not exist at the Cytec site. Also, a review of literature on several injection sites within EPA Region V, where monitoring wells were required, showed that the site specific geology at each of these was different than at Cytec.

The LDEQ evaluated the conditions at the Cytec site, even requiring the facility to submit subsurface seismic line information for additional assurance in evaluating the request for reduction in monitoring requirements. The Department concluded, after considering among other factors, the nature of the confining zone and the hydrogeologic conditions at the Cytec site and the continuous, extensive monitoring of the injection well bore, to grant Cytec's request for an exemption from some of the monitoring requirements. At this time, the monitoring requirements as stated in LAC 33:V.2271.N.2.a & c are deemed unnecessary and would pose an undue risk to the confining zone.

A concern was raised during the public comment period about a letter signed by Paul H. Templet, the former Secretary of the Department dated December 18, 1991. This letter addressed to James H. Welsh, with the Louisiana Department of Natural Resources (DNR), indicated that monitoring below the USDW is the only means of providing information on waste movement. This letter was sent as comments relative to a particular injection site other than Cytec's and was not intended as a promulgation of a regulation or even as a departmental policy or guidance document. The regulations in place then and the current regulations (LAC 33:V.2271.N) do require extensive monitoring of the operation of an injection well with a land disposal restriction exemption. The letter from Paul Templet to DNR does not override these regulations. The Department has determined that, at this time, Cytec has met all regulations regarding monitoring (LAC 33:V.2271.N).

RESPONSES TO "IT" QUESTIONS

- I. Have the potential and real adverse environmental effects of the proposed facility been avoided to the maximum extent possible?**

Yes, the potential and real adverse environmental effects of this deepwell injection system have been avoided to the maximum extent possible. This is accomplished through the handling of the injection waste in the deepwell pretreatment area. Volume 7 details extensively Cytec's studies concerning the use of underground injection wells versus other treatment alternatives. Cytec's waste reduction program has been steadily reducing the toxicity and volume of the injection wastes.

Before injection, the waste is handled in a closed system of tanks. These tanks are classified as hazardous waste tanks and are subject to the design, secondary containment, and inspection standards of the state hazardous waste regulations (RCRA Operating Permit LAD 008 175 390). This minimizes the potential and real adverse effects to the soil and groundwater.

Volume 7, of the petition, dated March, 1992, contains Cytec's evaluation of alternatives to deepwell injection. These studies demonstrated that alternative technologies would increase air emissions, and/or increase the amount of organics and salts discharged to surface water, and/or increase total energy usage and/or increase the amount of solids needing further disposal. By utilizing the injection system, potential and real adverse effects resulting from other treatment or disposal methods have been minimized.

Cytec is required, under the no-migration exemption from the EPA, the LDEQ, and their permit from the Louisiana Department of Natural Resources, to perform annual bottom hole pressure surveys on each injection well. Cytec is also required under federal and state regulations to perform a pressure test on each injection well on an annual or more frequent basis. Additionally, Cytec periodically tests the metal thickness and inspects the protective internal well casing, and inspects the thickness of the well pipe which comes into contact with corrosive streams quarterly. Based on the information submitted in the petition, its supplement, and responses to NODs, underground injection of these wastes minimizes the potential and real adverse environmental effects to all media and the public.

Volume 7 of the petition details Cytec's comprehensive evaluation of alternatives to deepwell injection. Cytec's "Waste Reduction Program" dated June, 1990, and Letter dated March 18, 1992 (located in Volume 15, Section G), detail Cytec's ongoing commitment to reducing the volume and toxicity of the wastewater effluents deepwell injected using such methods as new equipment installation, source reduction, and reuse when appropriate and applicable. Cytec's waste reduction efforts demonstrate extensive efforts to further reduce potential and real adverse environmental impacts of injection wells.

- II. Does a cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter

outweighs the former?

Yes, the social and economic benefits outweigh the environmental impact costs of the five underground injection wells. The social and economic benefits from the operation of Cytec's Fortier Plant to the local community are extensive. At the same time, the absence of adverse environmental impacts, during the 30 years that their injection wells have been in operation, indicate that the benefits clearly outweigh the any adverse impacts associated with their operation.

As described in a letter dated March 18, 1992 (located in Volume 15, Section G), Cytec employs approximately 800 Louisiana citizens. Economic and social benefits of the plant operation include the purchase of supplies and services from the local community, thereby supporting many jobs; and production of desirable commodities used to manufacture consumer products at minimal prices due to site access to shipping modes and raw material manufacturers and product users. These benefits to society would not be possible without the operation of injection wells because the facility cannot operate without the use of these wells.

There will be no anticipated environmental impact costs from the operation of injection wells. Cytec operates its injection wells under federal and state permits and complies with all existing regulations. Based on EPA's approval of Cytec's no-migration petition, and the LDEQ's review of the petition, operation of these wells will not threaten the USDW.

III. Are there alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing nonenvironmental benefits?

No, there are no alternative projects which would offer more protection to the environment without unduly curtailing nonenvironmental benefits. Cytec and their consultants conducted a study on alternative processes (detailed in Volume 7 of the petition). The processes considered in this study included incineration, wet air oxidation of process wastewater effluents, in-process source reduction, reuse utilizing coal gasification, reclamation, and oxidation and biological treatments. Instituting these alternative processes in lieu of deepwell injection would create indirect environmental impacts (air emissions, solid waste production, surface water discharges) and require transportation off-site for some of the new wastes generated. Using energy for destruction, treatment and transportation causes indirect, negative environmental impacts associated with the exploration, development, and production of crude oil, natural gas, coal, and other fossil fuels. Therefore, there are no alternative processes which are economically feasible and protect the environment greater than injecting the wastes into underground injection wells.

IV. Are there alternative sites which would offer more protection to the environment

than the proposed facility site without unduly curtailing nonenvironmental benefits?

No, there are no alternative sites which would offer more protection to the environment without unduly curtailing nonenvironmental benefits. Using alternative sites to dispose of the Cytec waste would have an adverse economic effect on Cytec and increase public exposure to this waste.

The potential for adverse environmental impact of transporting this large volume of waste over public highways and/or railroad transportation greatly exceeds the potential impact of underground injection on-site. By demonstrating permanent confinement of the waste (Volume 1, Section 8 and Volume 3 of the petition and American Cyanamid Response to EPA's NOD dated December, 1992), Cytec has shown that their site is suitable for the injection of hazardous waste. The no-migration demonstration establishes that the Cytec site offers, at a minimum, 10,000 years of protection to the environment.

V. Are there mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing nonenvironmental benefits?

No, there are no mitigating measures which would offer more protection to the environment without unduly curtailing nonenvironmental benefits.

Alternative technologies were discussed in response to "IT" question III. No alternative processes have been identified which are economically feasible and offer more protection to the environment than underground injection wells.

Ongoing mitigating measures include the waste minimization program discussed in response to "IT" question I. This program has been constantly reducing the potential environmental impact of the five underground injection wells. Additionally, Cytec must submit a revised waste reduction plan each March in accordance with LAC 33:V.2271.Z.

CONCLUSION

The LDEQ has determined that Cytec used proper quality assurance and quality control in preparing its petition. Specifically, Cytec has followed appropriate protocol in identifying and locating records for artificial penetrations within the 2.0 mile radius of the injection wells and the predicted waste plume movement area. Information submitted by Cytec regarding the geology, waste characterization, hydrology, no-migration modeling, and well construction has been verified

or bounded by worse-case scenarios.

After a detailed and thorough review of the Cytec petition, with its supplements and responses to NODs, responses to the "IT" Questions, and the comments received during the public comment period, the LDEQ determined that Cytec has met all land disposal restriction requirements contained in LAC 33:V. Chapter 22. In meeting these requirements, Cytec has demonstrated for the wastes being injected:

- There are no other economically and environmentally reasonable alternatives to disposal by injection well.
- The waste streams cannot be reasonably eliminated or significantly reduced.
- To a reasonable degree of certainty, the waste will be permanently confined.
- The petition is for specific wastes to be injected into specific wells.
- The waste will be monitored as required by the regulations.

CONDITIONS FOR APPROVAL:

- 1.a) Cytec will, within 180 days of petition approval, drill an ambient monitoring well approximately 1000 feet deep. The well shall be ideally located for security, maintenance, quality control and detection of any upward waste movement into the lowermost Underground Source of Drinking Water (USDW). A continuous lithology log shall be maintained from the surface to total depth. *(This condition has been completed.)*
- b) Soil samples shall be collected every ten (10) feet or at significant lithology changes for the first 100 feet \pm (depth of the driven surface casing). The sample exhibiting the highest field screened OVA (organic vapor analyzer) reading shall be analyzed, utilizing USEPA SW-846 methods, for the following: volatile organic compounds (Method 8240) and site-specific parameters as stated in Table 5.1 of the submitted Cytec Groundwater Monitoring Plan. The waters contained in the first water bearing zone and the sand unit known as the "point bar" sand shall also be analyzed for these parameters. *(This condition has been completed.)*
- c) Drill cutting samples shall be taken from below surface casing to total depth at

every connection (30 feet \pm). *(This condition has been completed.)*

- d) All soil and drill cutting samples shall be stored at the facility for a period of not less than three (3) years.
 - e) Cytec shall sample the waters contained in the lowermost USDW quarterly for a period of one year to establish background levels for monitoring. All background establishing data shall be submitted to the LDEQ as soon as the data is available. *(This condition has been completed.)*
 - f) After background levels have been established, sampling shall be semi-annually and the results submitted to the LDEQ, Land Ban Section within fifteen (15) days after receiving the analytical results. If a change in monitoring parameters is detected which is outside the limits of natural variabilities, the LDEQ shall be notified immediately and sampling shall be conducted monthly until the cause of the change can be determined by the facility with approval of the administrative authority. Monthly test results shall be submitted to the LDEQ within fifteen (15) days of testing.
 - g) In addition to those parameters submitted by Cytec in Table 5.1 of the Groundwater Monitoring Plan, the waters contained in the lowermost USDW shall be tested for any changes in pH, concentration of chlorides, sulfates, and ammonia constituents. All sampling and testing shall be conducted in accordance with the applicable sections contained in "Testing Methods for Evaluating Solid Waste" EPA/SW 846, unless designated otherwise in this approval. All test results shall be maintained in the facility operating record.
 - h) This ambient monitoring plan shall continue for thirty (30) years after the closure of the injection wells.
2. Injection of restricted waste shall be limited to the injection interval ranging in depth from 2990 feet to 3220 feet within an injection zone ranging in depth from 2000 feet to 6132 feet.
 3. The cumulative injected volume for the facility shall not exceed 64,800,000 gallons per month into the "3,000 foot" sand.
 4. The facility shall cease injection of restricted hazardous waste by March 1, 2006, in accordance with the USEPA exemption conditions.
 5. The characteristics of the injected waste stream shall at all times conform to those

ATTACHMENT A
REASONS FOR APPROVAL
Cytec Industries, Inc. Exemption Petition
Page 22

stated in the petition.

6. The injected waste is limited to the following hazardous waste codes: D001, D002, D003, F001, K011, K013, P063, P069, U002, U003, U007, U008, U009, U092, U154, U162, and U220.
7. Cytec must petition for approval to inject additional hazardous wastes which do not conform to Conditions No. 5 and No. 6 above. Cytec must also petition for approval to increase the concentration of the waste which would necessitate the recalculation of the limiting concentration reduction factor and the extent of the waste plume.
8. Cytec shall, in accordance with LAC 33:V.2242.Z (now LAC 33:V.2271.Z), submit a detailed report describing the efforts undertaken during the preceding calendar year to reduce the volume and toxicity of the waste generated. At a minimum, one waste reduction activity shall be implemented each year (i.e. Source reduction, recycling, reclamation, reuse, material substitution, etc.).

Noncompliance with any of these conditions is grounds for termination of the exemption in accordance with LAC 33:V.2271.S.1.a.

Therefore, the LDEQ hereby issues these reasons for and findings in support of the approval, with conditions, of Cytec's exemption petition.

Baton Rouge, Louisiana, this 8th day of August, 1996


J. Dale Givens, Secretary

ATTACHMENT B

COMMENTS AND RESPONSES

CYTEC INDUSTRIES, INC.

No-Migration Petition

LAD 008 175 390

On January 7, 1994, the Louisiana Department of Environmental Quality (LDEQ), proposed to approve Cytec's petition for an exemption to the land disposal restrictions. The public comment period associated with this proposed decision began on January 12, 1994, and closed on April 6, 1994. This comment period included the 45-day comment period required under LAC 33:V.2243 plus a 37-day extension. The draft document was available for viewing at the Jefferson Parish Environmental and Development Control Department, 1221 Elmwood Park Blvd., Suite 703, Harahan, Louisiana 70123 and at LDEQ, 7290 Bluebonnet Blvd., Baton Rouge, Louisiana 70810. A public hearing was held at the Kenner City Hall in Kenner, Louisiana, on March 7, 1994, to allow the general public an opportunity to present comments concerning the LDEQ's proposed decision.

The following is a summary of the LDEQ's response to public comments regarding the proposed decision on Cytec's petition.

1. **Comment:** Cytec's petition should be denied because hazardous waste injection is extremely dangerous activity and because there are alternative methods available.

Response: Deepwell injection of hazardous waste is a comparative safe method of disposal, and with their petition Cytec has demonstrated that there will be no migration out of the injection zone for 10,000 years. Cytec has also demonstrated that there are no economically feasible alternatives to injection.
2. **Comment:** It is extremely important that there be an adequate monitoring system in place.

Response: Cytec will, in accordance with LAC 33:V.2271.N,* have an adequate monitoring system in place.
3. **Comment:** The list of approved waste codes did not include the EPA hazardous waste number U003. This waste code is already approved in the USEPA No-Migration Petition, approved in the LDNR Permit, and also approved by LDEQ under RCRA interim status.

Response: The USEPA hazardous waste U003 will be added to the list of approved waste for injection.

ATTACHMENT B
COMMENTS AND RESPONSES
Cytec Petition
Page 2

4. **Comment:** The LDNR replaced the old injection well permit number, WD 85-2 with a new more restrictive one, 93-07WD. This is the current LDNR permit number.

Response: The approval conditions will be changed to reflect the new LDNR permit number 93-07WD.

6. **Comment:** One commenter requested the requirement that monthly sampling results be submitted within 15 days of testing, as stated in approval condition No. 1.f., be changed to "Monthly test results shall be submitted to the DEQ as soon as the data is available."

Response: This condition will not be changed.

7. **Comment:** There's got to be something else that can be done with this waste, and I would like to see more aggressive waste minimization and pollution prevention aspects, and that should be a permit condition for this and all other injection wells.

Response: Cytec has waste minimization plans in place and the company provided detailed reports on waste minimization efforts that it has undertaken as required by LAC 33:V.2271.C.*

8. **Comment:** The LDEQ should deny Cytec's petition because it fails to provide for adequate monitoring and Cytec's proposed monitoring program does not comply with the regulations.

Response: A condition of this approval is that Cytec will, within 180 days of approval, drill a monitoring well approximately 1000' deep. This depth will ensure that the lowermost underground source of drinking water can be sampled. The LDEQ has determined that Cytec has demonstrated to a reasonable degree of certainty, through the use of geologic mapping, geologic cross sections, well log work, and confidential seismic lines, that the waste will be permanently confined and that there are no transmissive faults or fractures in the predicted plume area. The LDEQ finds that Cytec has shown the installation of deep monitoring wells, other than to monitor the lowermost USDW, as unnecessary and could pose an undue risk. By way of these demonstrations and fulfillment of the condition requiring a USDW monitoring well, Cytec complies with all monitoring regulations of LAC

33:V.2271.N.2.*

NOTE: This was the original response to comments received prior to initial approval of the request for exemption. In accordance with this condition, Cytec drilled a 1,000 foot monitoring well into the lowermost USDW.

9. **Comment:** The granting of the petition for exemption from the Land Disposal Restrictions would violate the Louisiana Constitution.
- Response:** In granting this exemption, the LDEQ has fully met its obligations to protect human health and the environment, and is in full compliance with all state regulations that govern land disposal restrictions for the State.
10. **Comment:** There is simply no legal justification for failing to require Cytec to monitor below the lowest USDW.
- Response:** The LDEQ has at this time exempted Cytec from monitoring below the lowermost USDW in accordance with LAC 33:V.2271.N.3.*
11. **Comment:** The cost of installing a monitoring well is not prohibitive.
- Response:** The LDEQ agrees the cost of monitoring well installation is not prohibitive. The well installation costs were never a consideration in the LDEQs determination to exempt Cytec from some of the monitoring requirements.

* At the time the public comment period was held, the section entitled "Exemptions to Allow Land Disposal of a Prohibited Waste by Deep Well Injections" was numbered LAC 33:V.2242. In the current regulations, promulgated on January 20, 1996, this section is now LAC 33:V.2271.

Appendix HH

**LAC 33:V.521
LAC 33:V.2111.B.3.**

Drawing No. 36-0-33	Container Storage Building Site, Drainage and Paving Plan
Drawing No. 36-1-19	Container Storage Building Piling Layout Plan
Drawing No. 36-1-20	Container Storage Building Foundation Plan
Drawing No. 36-1-21	Container Storage Building Foundation Sections and Details
Drawing No. 36-1-22	Container Storage Building Foundation, Drainage, and Paving Sections and Details
Drawing No. 36-4-1	Container Storage Building Architectural Floor Plan
Drawing No. 36-4-2	Container Storage Building Architectural Elevations
Drawing No. 36-4-3	Container Storage Building Architectural Sections and Details
Drawing No. 36-6-55	Container Storage Building Piping Plan and Sections

Reference Sheet



REF+51899

12/29/99 6:30 AM

Reference Sheet



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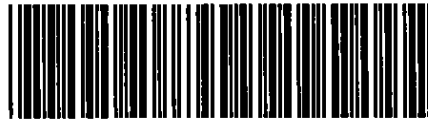
Reference Sheet



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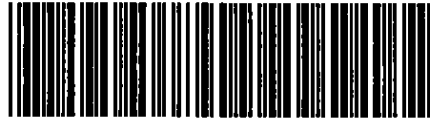
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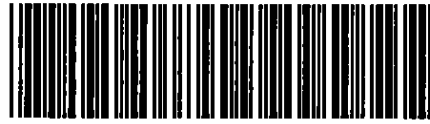
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APPENDIX II

**LAC 33:V.521.A.3
LAC 33:V.2111.B.3.**

Secondary Containment Capacity By Cell Volume Calculations

SECONDARY CONTAINMENT CAPACITY BY CELL

Volume Calculation Area (1)	Cell Designation	Maximum Storage Volume			Applicable Test; Largest Container or 10% Total Container Volume	Maximum Req'd. Containment Volume, Cu.Ft.	Existing Containment Volume, Cu.Ft.(1)
		Containers (2)	Gallons	Cu. Ft.			
F	Flammable Liquid	144	7920	1059	10% Total Container Volume	108	572.8
E	Miscellaneous	144	7920	1059	10% Total Container Volume	106	466
D	Acid	48	2640	353	10% Total Container Volume	36	151.1
C	Alkaline	48	2640	353	10% Total Container Volume	36	151.1
B	Oxidizer	48	2640	353	10% Total Container Volume	36	151.1
A	Rolloff Bin Area	4 ⁽³⁾	N/A ⁽⁴⁾	3200	Volume Largest Container	800	1169.6

NOTES:

- (1) Documentation of volume calculations are attached.
- (2) Based on a 55 gallon drum. Other types and sizes of containers may be used for storage.
- (3) Based on an 800 cubic foot bin with dimensions 4' x 8' x 25'.
- (4) Cytec does not anticipate storing free liquids in the Rolloff Bin Area. However, if Cytec does use the Rolloff Bin Area for drum storage, Cytec will limit the quantity of drums stored to meet the secondary containment requirements in LAC 33:V.2111.B.3.

VOLUME CALCULATIONS

FOR

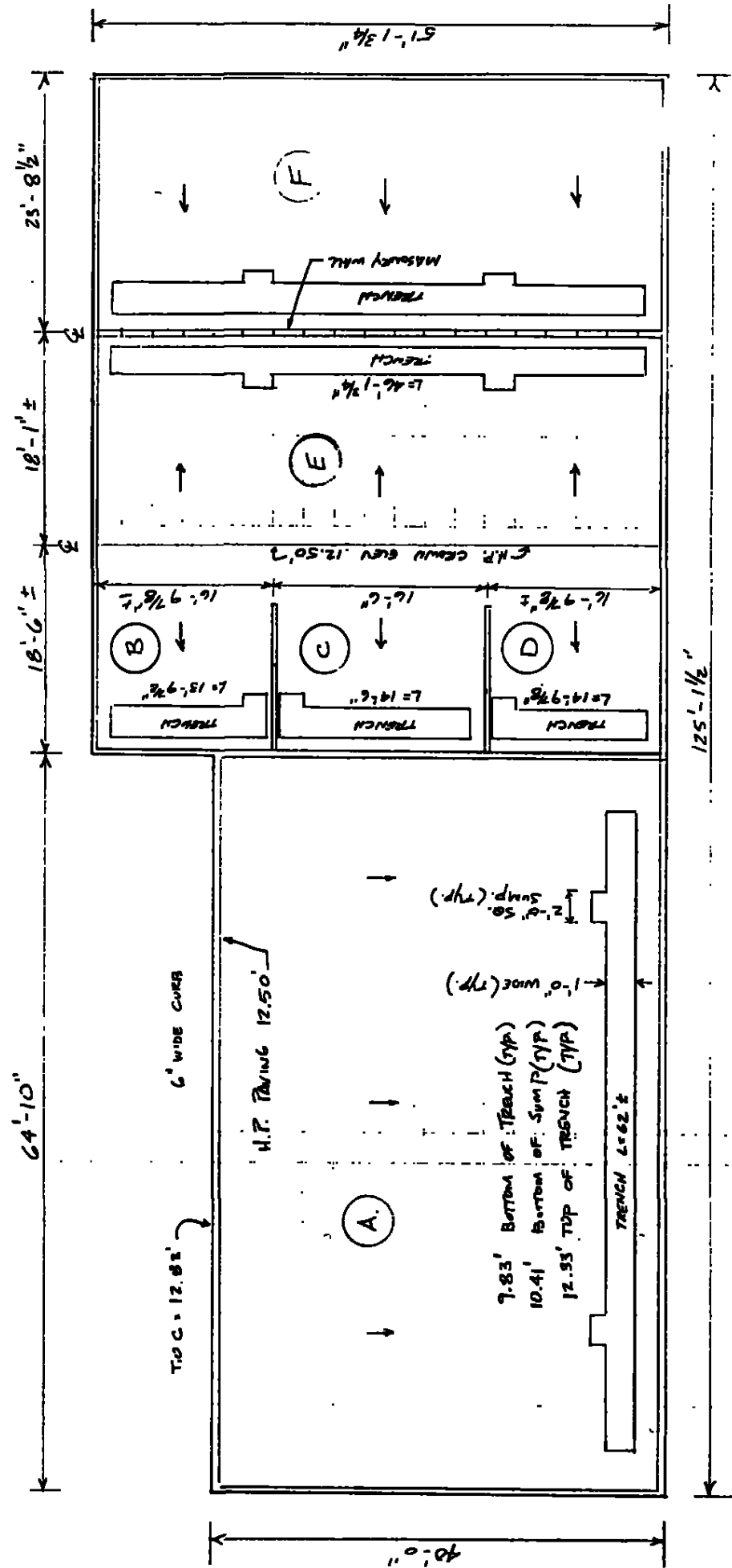
CONTAINER STORAGE BUILDING

AT

AMERICAN CYANAMID'S

E.O.P. UNIT

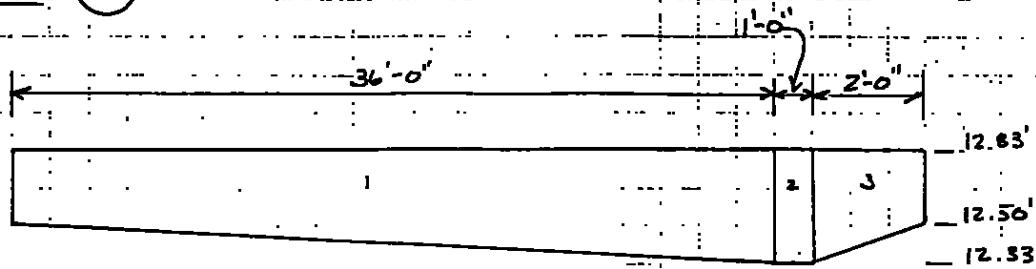
CHED DANTIN
CIVIL/PROJECT ENGR

PLAN

VOLUME CALCULATIONS

AREA

(A)



$$a_1 = \frac{1}{2} (.33' + .50') (36') = 14.94 \text{ ft}^2$$

$$a_2 = 1' \times 1.5' = 0.50 \text{ ft}^2$$

$$a_3 = \frac{1}{2} (.33' + .50') (2') = 0.83 \text{ ft}^2$$

$$16.27 \text{ ft}^2$$

$$V_F = 16.27 \text{ ft}^2 \times 64.33' = 1046 \text{ ft}^3 \quad \text{Floor Volume}$$

ADD TRENCH + Sumps

$$V_{\text{TRENCH}} = 62' \times 1.92' \times 1' = 119 \text{ ft}^3$$

$$V_{\text{SUMP}} = 2' \times 2' \times (2.5' - 1.92') \times 2 = 4.64 \text{ ft}^3$$

$$V_T = 1046 \text{ ft}^3 + 119 \text{ ft}^3 + 4.6 \text{ ft}^3 = 1169.6 \text{ ft}^3 \quad \text{TOTAL VOLUME}$$

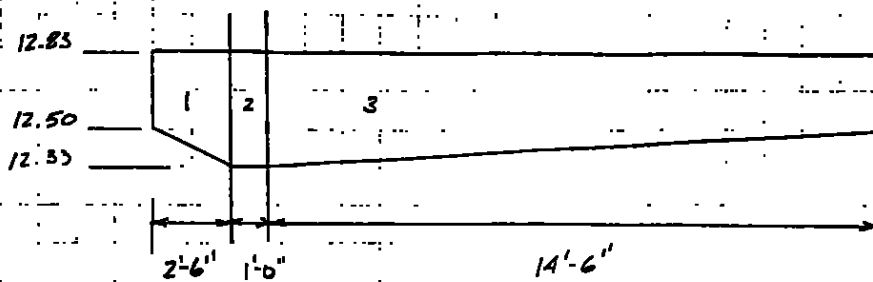
LARGEST CONTAINER IN THIS AREA (CURRENT)

$$1. \text{ CONTAINER @ } 4' \times 8' \times 25' = 800 \text{ ft}^3$$

$$1169.6 \text{ ft}^3 > 800 \text{ ft}^3 \quad \text{SUFFICIENT CAPACITY}$$

AREAS

(B) (C) (D)



$$A_1 = \frac{1}{2} (.33 + .50) (2.5') = 1.04$$

$$A_2 = 1' \times .5' = .50$$

$$A_3 = \frac{1}{2} (.33 + .50') (14.5') = 6.02$$

$$7.56 \text{ ft}^2$$

$$V_F = 7.56 \text{ ft}^2 \times 16' = 121 \text{ ft}^3 \quad \text{FLOOR VOLUME}$$

ADD TRENCH + SUMP

$$V_{\text{TRENCH}} = 14.5' \times 1.92' \times 1' = 27.84 \text{ ft}^3$$

$$V_{\text{SUMP}} = 2' \times 2' \times (2.5' - 1.92') = 2.32 \text{ ft}^3$$

$$V_T = 121 \text{ ft}^3 + 27.8 \text{ ft}^3 + 2.3 \text{ ft}^3 = 151.1 \text{ ft}^3$$

LARGEST CONTAINER IN THIS AREA IS A SINGLE

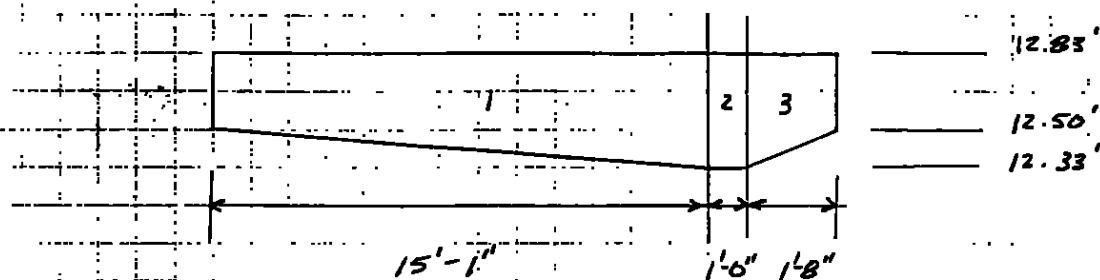
55 GALLON DRUM.

$$55 \text{ GAL} \times \frac{1}{7.48} = 7.35 \text{ ft}^3$$

$$151.1 \text{ ft}^3 > 7.35 \text{ ft}^3 \quad \text{SUFFICIENT CAPACITY}$$

AREA

(E)



$$a_1 = \frac{1}{2} (.33 + .50') (15.08') = 6.26 \text{ ft}^2$$

$$a_2 = 1 \times .5 = .50 \text{ ft}^2$$

$$a_3 = \frac{1}{2} (.33 + .50') (1.67') = .69 \text{ ft}^2$$

$$\underline{7.45 \text{ ft}^2}$$

$$N_F = 7.45 \text{ ft}^2 \times 50.11' = 373 \text{ ft}^3 \quad \text{FLOOR VOLUME}$$

ADD TRENCH + SUMPS

$$N_{\text{TRENCH}} = 46.15' \times 1.92' \times 1' = 88.6 \text{ ft}^3$$

$$N_{\text{sumps}} = 4.64 \text{ ft}^3$$

$$V_T = 373 \text{ ft}^3 + 88.6 \text{ ft}^3 + 4.6 \text{ ft}^3 = 466 \text{ ft}^3 \quad \text{TOTAL VOLUME}$$

LARGEST CONTAINER IN THIS AREA IS A 55 GALLON DRUM

$$466 \text{ ft}^3 > 7.35 \text{ ft}^3 \quad \text{SUFFICIENT CAPACITY}$$

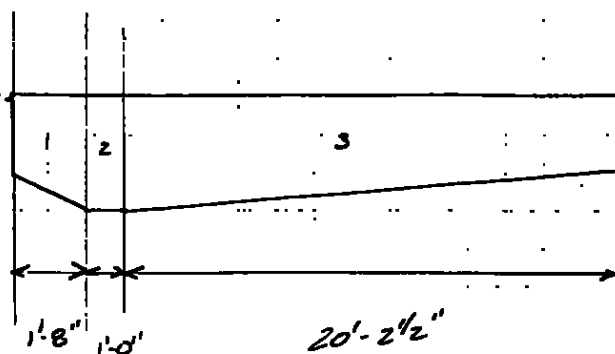
AREA

(F)

12.83

12.50

12.33



$$A_1 = \frac{1}{2} (.50 + .33) (1.67') = .69 \text{ ft}^2$$

$$A_2 = 1' \times .5' = .50 \text{ ft}^2$$

$$A_3 = \frac{1}{2} (.50' + .33') (20.2') = 8.38 \text{ ft}^2$$

$$9.57 \text{ ft}^2$$

$$V_F = 9.57 \text{ ft}^2 \times 50.11 \text{ ft} = 479.6 \text{ ft}^3 \quad \text{FLOW VOLUME}$$

ADD TRENCH + SUMPS

$$V_{\text{TRENCH}} = 88.6 \text{ ft}^3$$

$$V_{\text{SUMPS}} = 4.64 \text{ ft}^3$$

$$V_T = 479.6 + 88.6 + 4.64 = 572.8 \text{ ft}^3 \quad \text{TOTAL VOLUME}$$

LARGEST CONTAINER IS 55 GALLON DRUM

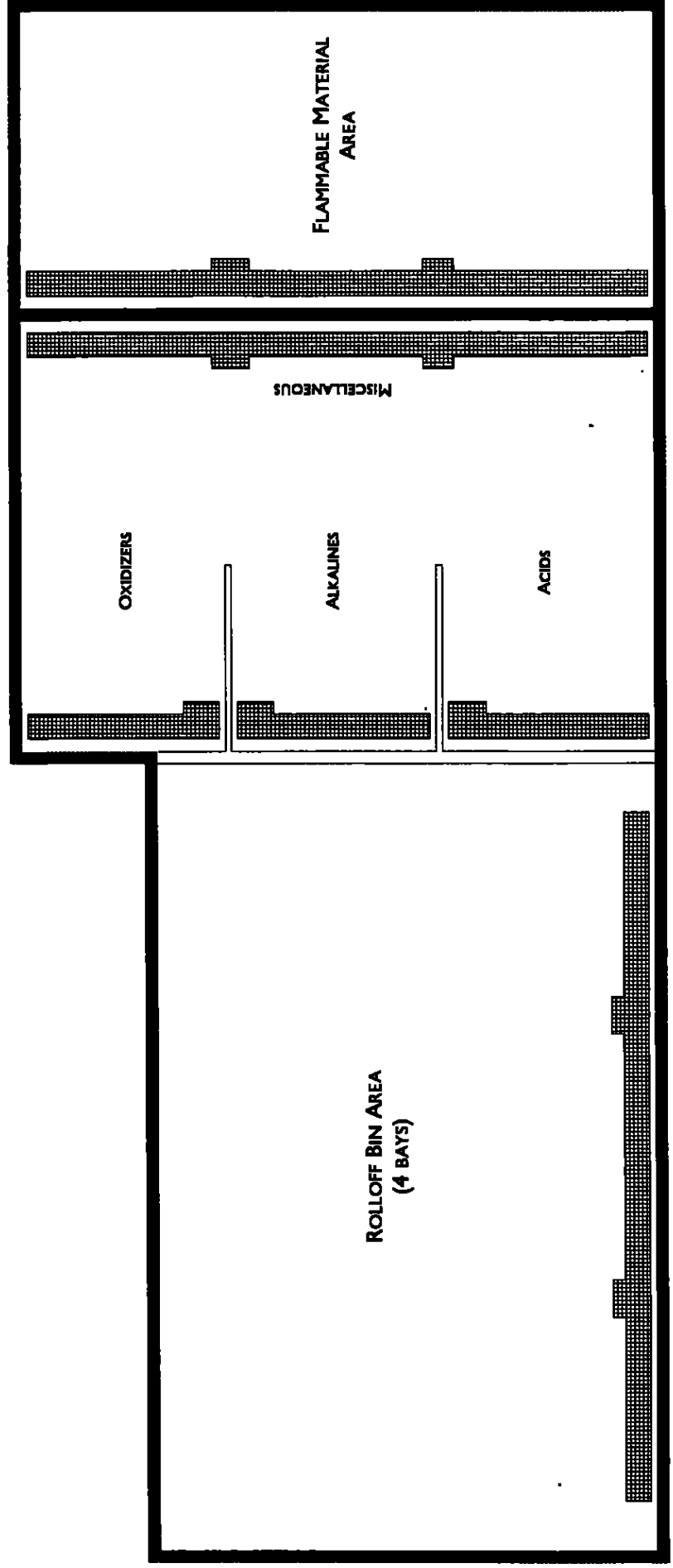
$$572.8 \text{ ft}^3 > 7.35 \text{ ft}^3 \quad \text{SUFFICIENT CAPACITY}$$

APPENDIX JJ

**LAC 33:V.521.C.
LAC 33:V.2115.C.**

**Container Storage Building
Example Waste Streams With Storage Unit Allocation**

CONTAINER STORAGE BUILDING



EXAMPLE WASTE STREAMS WITH STORAGE UNIT ALLOCATION

(Not all inclusive)

Potential Waste Stream Description	Potential EPA Waste Code(s)	Listing of Incompatible Materials	Storage Cell Allocation
Soil, concrete, other solids contaminated with Fortier waste codes	Refer to Part I Application Code Listing	NA	Rolloff Bin Area or Other
Spent solvent -Used oil contaminated with spent solvents -Rags contaminated with spent solvents.	F001/F002/F003/F004/F005	Strong acids, alkalis, oxidizers	Flammable Cell
Waste paint	D001/D004/D005/D006/D007/D008/D009/D010/D035/D043/F001/F002/F003/F005	Strong acids, alkalis, oxidizers	Flammable Cell
Waste combustible liquid	D001	Strong acids, alkalis, oxidizers	Flammable Cell
Deepwell backwash sand/solids	F001/K011/K013/P063/P069/U002/U003/U007/U008/U009/U092/U154/U162/U220	NA	Rolloff Bin Area or Other
Miscellaneous effluent liquid	D001/D002/D003/D007/D008/D018/D035/D038/D043/F001/F002/F003/F004/F005/K011/K013/P063/P069/U002/U003/U007/U008/U009/U092/U154/U162/U220	NA	Miscellaneous Liquid Cell or Other
Acetone	U002	Strong acids, alkalis, oxidizers	Flammable Cell
Acrylic Acid	U008	Oxidizers	Miscellaneous Liquid Cell or Other
Methanol	U154	Strong acids, alkalis, oxidizers	Flammable Cell
Acetone Cyanohydrin	P069	Alkalines; strong oxidizers, strong mineral acids	Miscellaneous Liquid Cell or Other
Lab Packs	Refer to Part I Application Code Listing	Based on Lab Packs contents	Miscellaneous Liquid Cell or Other (based on Lab Pack contents)

EXAMPLE WASTE STREAMS WITH STORAGE UNIT ALLOCATION

(Not all inclusive)

Potential Waste Stream Description	Potential EPA Waste Code(s)	Listing of Incompatible Materials	Storage Cell Allocation
Waste Sulfuric Acid	D002	Strong oxidizers, strong alkalis, organic materials, water	Acid Cell or Other
Acetonitrile	U003	Strong acids, strong alkalis, strong oxidizers	Flammable Cell
Acrylamide	U007	Acids, alkalis, oxidizers	Miscellaneous Liquid Cell or Other
Acrylonitrile	U009	Strong alkalis and oxidizers	Flammable Cell
Methyl Methacrylate	U162	Oxidizers, mineral acids	Flammable Cell
Toluene	U220	Strong oxidizers	Flammable Cell
Mixtures	Refer to Part I Application Code Listing	Characteristics of mixtures may not be consistent with characteristics of individual components. Mixture as a whole will be categorized based on characteristics. Storage cell allocation will be determined accordingly.	
Hytec Heat Transfer Salt (Solid)	D003	Acids, bases, flammables	Oxidizer Cell or Other
Wastewater Column Bottoms	D018/D038/K011	Acids	Miscellaneous Liquid Cell or Other
Recovery Column	K013	NA	Miscellaneous Liquid Cell or Other
Nickel/Cadmium Batteries	D006	NA	Miscellaneous or Other
Spent Fluorescent Lamps	D009	NA	Miscellaneous or Other
Miscellaneous Spent Lamps	D008	NA	Miscellaneous or Other
Lead Acid Batteries	D008	NA	Acid Cell or Other